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Date: April 29, 2008 /Kimberly Webb/
Kimberly Webb

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:	
Applicant(s): Messay Amerga, *et al.*	Examiner: Tu X. Nguyen
Serial No: 10/650,146	Art Unit: 2618
Filing Date: August 27, 2003	

Title: SEARCHING FOR NEIGHBOR CELLS WITHIN A FIXED TIME DURATION

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Dear Sir:

Applicant submits this brief in connection with an appeal of the above-identified patent application. A credit card payment form is filed concurrently herewith in connection with all fees due regarding this appeal brief. In the event any additional fees may be due and/or are not covered by the credit card, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1063 [QUAFP956US].

I. Real Party in Interest (37 C.F.R. §41.37(c)(1)(i))

The real party in interest in the present appeal is Qualcomm Incorporated, the assignee of the present application.

II. Related Appeals and Interferences (37 C.F.R. §41.37(c)(1)(ii))

Appellants, appellants' legal representative, and/or the assignee of the present application are not aware of any appeals or interferences which may be related to, will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims (37 C.F.R. §41.37(c)(1)(iii))

Claims 1-18 stand rejected by the Examiner. The rejection of claims 1-18 is being appealed.

IV. Status of Amendments (37 C.F.R. §41.37(c)(1)(iv))

The Examiner has not entered the amendments submitted after the Final Office Action. (*See* Communication from Examiner dated December 13, 2007).

V. Summary of Claimed Subject Matter (37 C.F.R. §41.37(c)(1)(v))

A. Independent Claim 1

Independent claim 1 recites an apparatus that comprises a searcher for: detecting a plurality of cells from a ranked list of monitored cells, searching each cell from a first list of cells during each of a series of cycles, and searching each cell from a subset of a second list of cells during each of the series of cycles; and a processor for: ranking the list of monitored cells to form a ranked list of monitored cells, selecting the first list of cells from the ranked list of monitored cells, and selecting the subset of the second list of cells, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle; wherein the number of cells in the first and second lists for each cycle is determined from the strength of the strongest cell from the ranked list of monitored cells. (*See e.g.*, paragraphs [1010], [1091], and [1092]).

B. Independent Claim 4

Independent claim 4 recites a method of monitoring neighbor cells that comprises: detecting a plurality of cells to form a list of monitored cells, ranking the list of monitored cells to form a ranked list of monitored cells, searching each cell from a first list of cells selected from the ranked list of monitored cells during each of a series of cycles, and searching each cell from a subset selected from a second list of cells during each of the series of cycles, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, the selected subset varying during each cycle, wherein the number of cells in the first and second lists for each cycle is determined from strength of the strongest cell from the ranked list of monitored cells. (*See e.g.*, paragraphs [1010], [1091], and [1092]).

C. Independent Claim 18

Independent claim 18 recites processor-readable media operable to perform: detecting a plurality of cells to form a list of monitored cells, ranking the list of monitored cells to form a ranked list of monitored cells, searching each cell from a first list of cells selected from the ranked list of monitored cells during each of a series of cycles, and searching each cell from a subset selected from a second list of cells during each of the series of cycles, the second list of cells comprising the remaining cells from a ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle, wherein the number of cells in the first and second lists for each cycle is determined from strength of a strongest cell from the ranked list of monitored cells. (*See e.g.*, paragraphs [1010], [1091], and [1092]).

VI. Grounds of Rejection to be Reviewed (37 C.F.R. §41.37(c)(1)(vi))

A. Whether claims 1-18 are unpatentable under 35 U.S.C. §103(a) over Jeong, *et al.* (US 7,089,004) in view of Haumount, *et al.* (2002/0032032).

VII. Argument (37 C.F.R. §41.37(c)(1)(vii))

A. Rejection of Claims 1-18 Under 35 U.S.C. §103(a)

Claims 1-18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jeong *et al.* (U.S. 7,089,004) in view of Haumount, *et al.* (2002/0032032). Reversal of the rejection is requested for at least the following reasons. Neither Jeong, *et al.* nor Haumount, *et al.* teach or suggest all features set forth in the subject claims.

> A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning. See *KSR v. Teleflex*, 550 U.S. ___, 127 S. Ct. 1727 (2007) citing Graham v. John Deere Co. of Kansas City, 383 U. S. 1, 36 (warning against a "temptation to read into the prior art the teachings of the invention in issue" and instructing courts to "'guard against slipping into the use of hindsight'" (*quoting Monroe Auto Equipment Co. v. Heckethorn Mfg. & Supply Co.*, 332 F. 2d 406, 412 (CA6 1964))).

The subject claims relate to a technique implemented in a mobile wireless station for searching neighbor base station cells within a fixed time duration for the purpose of cell reselection. A list of available cells can be ranked and divided into a higher ranked set and a lower ranked set. (*See* Specification, paragraph [1090]). The higher ranked cells can be searched and updated with every "awake" cycle. In addition, and in order to limit the amount of time spent during the awake cycle, only as many cells from the lower ranked set are searched as can be updated within the time remaining during the time-bounded awake cycle. To ensure that all cells on the ranked list are regularly searched and updated, while still satisfying the duration constraint on the awake time, the subset of lower ranked cells to be scanned can change with each cycle, until all of the lower ranked cells have been searched. (*See* Specification, paragraphs [1010] and [1091]). The searched subset of lower ranked cells can then begin again at the start of the list. In particular, independent claim 1 recites, *searching each cell from a first list of cells during each of a series of cycles; ...searching each cell from a subset of a second list of cells during each of the series of cycles; ... selecting the first list of cells from the ranked list of monitored cells; and selecting the subset of the second list of cells, the second list of cells*

comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle.

Contrary to the Examiner's contentions, Jeong, *et al.* fails to disclose these features of the subject claims. Jeong, *et al.* relates to a method for scheduling cell searches using search timers associated with each cell in a monitoring list. A search period is calculated for each cell in the monitoring list, and each cell is then assigned a search timer set for that cell's search period. These search timers determine when each cell is searched. (*See* Jeong, et al., column 9 lines 50-61). This search technique is materially distinct from, and in no way suggests, that taught by the subject claims. The Examiner asserts that the cell search timing chart of Figure 9, and the associated disclosure at column 11 lines 2-20, illustrates a high-priority list of cells being searched each cycle, and a subset of lower-priority cells (the undetected neighbor cells indicated by brackets 102 and 104) also being searched each cycle, the subset varying with each cycle. Applicant's representative respectfully disagrees with this interpretation of Figure 9. The indicated section of the cited reference merely discloses a plurality of cells that are searched at a number of different search periods, each cell searched according to its own search time. Specifically, Cell 1 (the active cell) is searched every 40ms, Cell 2 every 100ms, and Cells 3-24 every 400ms (in staggered groups of 6). This methodology results in the search timing chart illustrated in Figure 9 of Jeong, *et al.* As can be seen in that figure, there are multiple search cycles of Cell 2 *during which no other cells are scanned.* Hence, the method disclosed by Jeong, *et al.* teaches away from the subject claims, which teach that for *each search cycle* a higher ranked set of cells from the monitored list *plus a subset of the lower ranked cells* can be scanned, wherein the subset of lower ranked cells can vary with each cycle. This search routine would result in a first set of cells being searched with each cycle, with a subset of a second set of cells scanned *within the same cycle as the first set*, the subset *varying with each cycle.* This search method is in no way suggested by Jeong, *et al.*, either in Figure 9 or the associated descriptions.

To further illustrate this distinction, it can be seen in Figure 9 of Jeong, *et al.* that cell groups 102, 104, and the group containing cell 106, which the Examiner equates to the varying subsets of the second list of cells (see the Advisory Action dated December 13, 2007) are being scanned sequentially *without any higher priority cells being scanned within the same cycles.* This also contrasts with the subject claims, which disclose that during each search cycle a first list of cells *plus* a varying subset of a second list of cells are scanned. If the respective scans of

groups 102, 104, and the group containing cell 106 are each taken to be a separate scan cycle (as the Examiner suggests in the Advisory Action), it is evident that these cycles each scan a varying subset of a list of cells *without also scanning a fixed first list of cells within each cycle.*

Haumont, *et al.* likewise fails to disclose these cell scanning features. Haumont, *et al.* relates to a method for reselecting a cell for a mobile station while still retaining benefits of localized service areas, but nowhere teaches or suggests the cell search and update method disclosed by the subject claims.

In addition to the features already discussed, the subject claims also disclose that the number of cells in each of the first and second lists of cells can be based on the strength of the strongest monitored cell. For example, a variable threshold can be determined that divides the total list of monitored cells between the higher ranked (the first list) and lower ranked (the second list) cells, and this threshold can be function of the strength of the strongest cell on the monitored list. (See Specification, paragraph [1091]). In particular, independent claim 1 recites, *the number of cells in the first and second lists for each cycle is determined from strength of a strongest cell from the ranked list of monitored cells.*

While conceding that Jeong, *et al.* does not disclose this aspect of the subject claims, the Examiner asserts that Haumont, *et al.* remedies this deficiency. Specifically, the Examiner indicates paragraph [0013] of that reference, which merely discusses the functionality of a Penalty_Time parameter, which runs for a cell when a mobile station places the cell on a list of the strongest carriers. Presumably, it is this reference to placing a cell on a list of strongest carriers that the Examiner contends anticipates the aforementioned feature of basing the number of cells in the first and second lists on the strength of the strongest cell. However, this passage of Haumont, *et al.* does not ascribe any specific functionality to the *strength of the strongest cell in a list*, much less utilizing this strength to determine the number of cells to be allocated in a first and second list. Merely observing that a list of the strongest cells detected by a mobile station can be constructed does not in anyway suggest using the *strength* of the strongest cell in such a list to determine the number of cells to be allocated to a first and second list. Indeed, this aspect is nowhere taught or suggested in Haumont, *et al.* As such, that cited reference does not make up the shortcomings of Jeong, *et al.* with regard to this aspect of the subject claims.

Similarly, independent claim 4 recites, *searching each cell from a first list of cells selected from the ranked list of monitored cells during each of a series of cycles; and searching*

each cell from a subset selected from a second list of cells during each of the series of cycles, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle, and wherein: the number of cells in the first and second lists for each cycle is determined from strength of the strongest cell from the ranked list of monitored cells. As discussed *supra*, neither Abbott, *et al*. nor Haumont, *et al*. disclose these aspects of the subject claims.

Also, independent claim 18 recites, *searching each cell from a first list of cells selected from the ranked list of monitored cells during each of a series of cycles; and searching each cell from a subset selected from a second list of cells during each of the series of cycles, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle, and wherein: the number of cells in the first and second lists for each cycle is determined from strength of a strongest cell from the ranked list of monitored cells*. As already noted, the cited references fail to teach or suggest these features.

In view of at least the foregoing, it is respectfully submitted that Jeong, *et al*. and Haumont, *et al*., individually or in combination, do not teach or suggest each and every feature set forth in independent claims 1, 4, and 18 (and all claims depending there from) and as such fail to make obvious applicant's claimed subject matter. It is therefore requested that this rejection be reversed.

C. Conclusion

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejections of claims 1-18 be reversed.

If any additional fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [QUAFP956US].

Respectfully submitted,
AMIN, TUROCY & CALVIN, LLP

/Himanshu S. Amin/
Himanshu S. Amin
Reg. No. 40,894

AMIN, TUROCY & CALVIN, LLP
24th Floor, National City Center
1900 East 9th Street
Telephone: (216) 696-8730
Facsimile: (216) 696-8731

VIII. Claims Appendix (37 C.F.R. §41.37(c)(1)(viii))

1. An apparatus, comprising:

a searcher for:

detecting a plurality of cells to form a ranked list of monitored cells;

searching each cell from a first list of cells during each of a series of cycles; and

searching each cell from a subset of a second list of cells during each of the series of cycles; and

a processor for:

ranking the list of monitored cells to form a ranked list of monitored cells;

selecting the first list of cells from the ranked list of monitored cells; and

selecting the subset of the second list of cells, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle; and

wherein:

the number of cells in the first and second lists for each cycle is determined from strength of a strongest cell from the ranked list of monitored cells.

2. The apparatus of claim 1, wherein:

the processor further:

compares the number of cells in the list of monitored cells to a pre-determined search number; and

wherein:

the ranking, selecting the first list, and selecting the subset of the second list is performed when the number of cells in the monitored list is greater than the pre-determined search number.

3. The apparatus of claim 2, wherein the processor directs the searcher to search each cell in the list of monitored cells when the number of cells in the monitored list is less than or equal to the pre-determined search number.

4. A method of monitoring neighbor cells, comprising:

detecting a plurality of cells to form a list of monitored cells;

ranking the list of monitored cells to form a ranked list of monitored cells;

searching each cell from a first list of cells selected from the ranked list of monitored cells during each of a series of cycles; and

searching each cell from a subset selected from a second list of cells during each of the series of cycles, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle; and

wherein:

the number of cells in the first and second lists for each cycle is determined from strength of the strongest cell from the ranked list of monitored cells.

5. The method of claim 4, further comprising:

comparing the number of cells in the list of monitored cells to a pre-determined search number; and

wherein the ranking, searching the first list, and searching the subset of the second list is performed when the number of cells in the monitored list is greater than the pre-determined search number.

6. The method of claim 5, further comprising:

searching each cell in the list of monitored cells when the number of cells in the monitored list is less than or equal to the pre-determined search number.

7. The method of claim 4, wherein each subset selected from the second list is selected in round-robin fashion.

8. The method of claim 4, wherein the cells are ranked in decreasing order of measured signal strength.

9. The method of claim 4, wherein the detecting step is repeated with a minimum frequency according to one or more pre-determined refresh parameters.

10. The method of claim 9, wherein the detecting step comprises one or more search types.

11. The method of claim 10, wherein the detecting step comprises intra-frequency searching.

12. The method of claim 10, wherein the detecting step comprises inter-frequency searching.

13. The method of claim 10, wherein the detecting step comprises inter-radio access technology searching.

14. The method of claim 10, wherein the one or more refresh parameters are associated with the one or more search types.

15. The method of claim 4, wherein the plurality of cells detected comprises intra-frequency cells.

16. The method of claim 4, wherein the plurality of cells detected comprises inter-frequency cells.

17. The method of claim 4, wherein the plurality of cells detected comprises inter-radio access technology cells.

18. Processor readable media operable to perform the following steps:

detecting a plurality of cells to form a list of monitored cells;

ranking the list of monitored cells to form a ranked list of monitored cells;

searching each cell from a first list of cells selected from the ranked list of monitored cells during each of a series of cycles; and

searching each cell from a subset selected from a second list of cells during each of the series of cycles, the second list of cells comprising the remaining cells from the ranked list of monitored cells not selected in the first list of cells, and the selected subset varying during each cycle; and

wherein:

the number of cells in the first and second lists for each cycle is determined from strength of a strongest cell from the ranked list of monitored cells.

IX. Evidence Appendix (37 C.F.R. §41.37(c)(1)(ix))

None.

X. Related Proceedings Appendix (37 C.F.R. §41.37(c)(1)(x))

None.